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Published in:
Educational Technology Solutions

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Recommended citation(APA):
Kinash, S., Kordyban, R., & Long, S. (2015). Technology for teaching and learning outside. *Educational Technology Solutions*, 66, 52-55.

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4-1-2015

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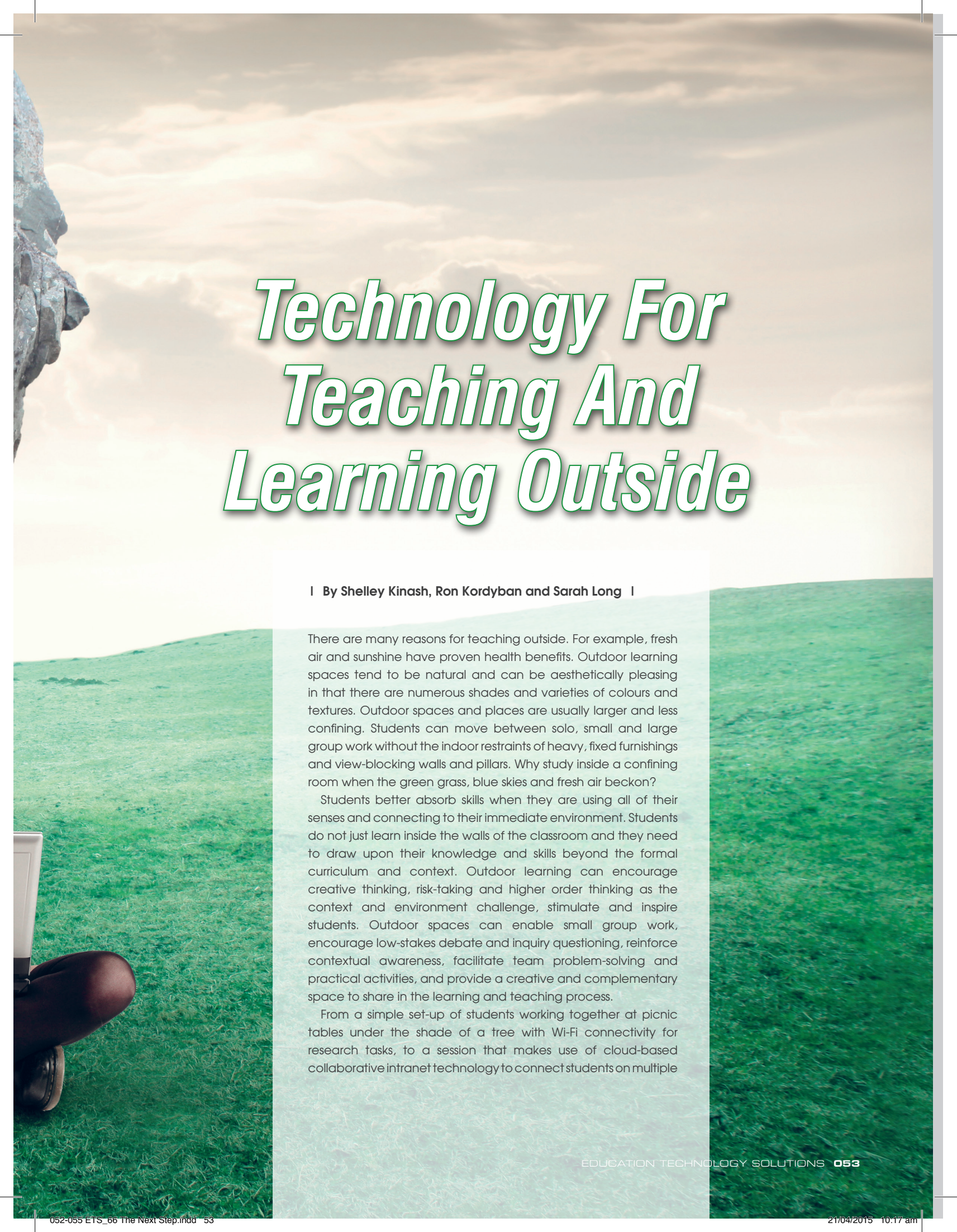
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Recommended Citation

Kinash, Shelley; Kordyban, Ron; and Long, Sarah, "Technology for teaching and learning outside" (2015). *Learning and Teaching papers*. Paper 95.
<http://epublications.bond.edu.au/tls/95>

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The background of the page is a photograph of a person sitting on a grassy hill. The person is wearing dark clothing and has a laptop open on their lap. The sky is filled with soft, white clouds, and the grass is a vibrant green. The overall mood is peaceful and conducive to learning.

Technology For Teaching And Learning Outside

| By Shelley Kinash, Ron Kordyban and Sarah Long |

There are many reasons for teaching outside. For example, fresh air and sunshine have proven health benefits. Outdoor learning spaces tend to be natural and can be aesthetically pleasing in that there are numerous shades and varieties of colours and textures. Outdoor spaces and places are usually larger and less confining. Students can move between solo, small and large group work without the indoor restraints of heavy, fixed furnishings and view-blocking walls and pillars. Why study inside a confining room when the green grass, blue skies and fresh air beckon?

Students better absorb skills when they are using all of their senses and connecting to their immediate environment. Students do not just learn inside the walls of the classroom and they need to draw upon their knowledge and skills beyond the formal curriculum and context. Outdoor learning can encourage creative thinking, risk-taking and higher order thinking as the context and environment challenge, stimulate and inspire students. Outdoor spaces can enable small group work, encourage low-stakes debate and inquiry questioning, reinforce contextual awareness, facilitate team problem-solving and practical activities, and provide a creative and complementary space to share in the learning and teaching process.

From a simple set-up of students working together at picnic tables under the shade of a tree with Wi-Fi connectivity for research tasks, to a session that makes use of cloud-based collaborative intranet technology to connect students on multiple

campuses, outdoor education can be anything learners and teachers need it to be. Groups can come together face-to-face outside of the strict confines of the traditional indoor classroom – sparking debate and discussion often not seen in the formalised structure of a lecture room or classroom setting. Students can also connect in active, participatory learning that encourages freedom and flexibility, as well as a potentially less threatening environment. Small groups moving from different stations to discuss aspects of a topic, or breaking out into on or offline discussion groups are sometimes easier and more productive through outdoor lesson models. Role plays, team project work and more active learning activities can be enjoyed by students without sacrificing access to class notes and learning materials with stable Wi-Fi connectivity and access to sharing apps and software solutions.

Extending the classrooms beyond the traditional brick walls of schools and universities to learning outside is now possible with the advent of mobile technologies. In addition, the expanding technology infrastructure systems, combined with the growing number of software and apps, has enabled and empowered what and how students can learn. In today's world, information is ubiquitous and mobile devices are becoming more powerful and able to manage an increasing array of tasks and functions. Most students have, within their backpacks or palms, tools that are able to connect to friends, teachers and researchers through social networks, emails and texts. Mobile devices make it possible to record and edit images and audio for videos and podcasts and then share them immediately. As easily on a park bench as in a school or university computer lab, students can access the web and their schools' Learning Management Systems (LMS), write essays, do projects, conduct research and watch and critique videos. The number of new learning tasks now available to learn is as staggering as it is exciting, and the new

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norm is for students to Skype, Tweet and Google their way through learning tasks, regardless of physical location.

Technology-enabled outdoor teaching tends to improve the climate and culture of learning. Teachers and students report feeling liberated, energised and cohesive. The sessions can promote seeing learning and teaching through a different lens and thus enable new ideas, learning possibilities and unique ways of activating knowledge. Research results show that natural environments have a positive effect on retention and recall because information tends to be robustly stored and readily retrieved when associated with unique physical settings. Educational researchers recommend mixing up and varying learning spaces to create associated memories. Outdoor 'classrooms' are conducive to this flexibility and novelty. Furthermore, there is more activity in outdoor learning spaces. For example, people walk by. Conversations are overheard. Birds fly over. Weather and light patterns change. These variations can become opportunities for incidental learning as teachers and students become more aware of what is happening around them and applicable examples emerge.

The contemporary educational landscape includes smartphones, laptops and tablets as mainstream tools. An increasing number of wearable technologies such as Google Glass and Apple Watches are emerging. The exciting potential of embeddable technology is on the near horizon. The increase in range and power of Wi-Fi systems and the elimination of areas without signal access

means that the once remote and cut-off areas across schools and campuses are now fertile grounds for learning.

The nature of the digital world is such that time and geography are losing their hold over education innovation. The popular mantra of learning 'anytime and anywhere' has translated into a migration from traditional face-to-face in-class learning into studying in parks, on buses and in cafes at a time of the students' choosing, rather than being limited to pre-set class schedules. Blends of synchronous and asynchronous learning have become the norm and learning is often virtual, making physical attendance less important and sometimes irrelevant. Discussion board posts, and participation in online synchronous collaboration and cloud-based sharing, such as through wikis, are the new mainstay of the future information workers and creators.

As the rise of virtual learning opportunities continues, teacher-based face-to-face lectures are no longer the primary source for many students. There is exponential growth in the quantity and quality of resources through Massive Online Open Courses (MOOCs), online educational videos and increasingly collaborative social learning networks. Many pedagogical innovators are focussing their efforts on engaging multimedia delivery of content that can address the ever-increasing learning diversity, further accommodating the needs of a wider spectrum of learners and diverse range of learning styles.

Certain disciplines are particularly conducive to learning outside. For example, school-based physical

education and university-based kinesiology, occupational and physical therapy are optimally suited for learning outside. There is space to move. There are objects to climb, manipulate, lift and carry. There are hazards to consider and negotiate, thus building empathy for future clients with mobility impairments. Technologies such as GPS, pedometers and heart-rate monitors complement the curriculum.

Sociology and psychology (particularly social psychology) are afforded interesting and compelling cases. How do people move about outside? Solo or in groups? To what extent are power imbalances observable? Are people texting while walking or are they appearing to observe their natural surroundings? Do people notice being observed? Is there a researcher effect? Mobile devices expedite creation, storage, analysis and sharing of field notes.

Architecture and environmental studies are natural choices for outdoor learning. Natural artefacts can be collected, charted and measured with the help of mobile technologies. The design of built-environments can be observed and evaluated. Animal tracks and patterns can be noted, recorded and annotated. Using concise instruments, air and soil quality can be tested.

The outside environment is a noble and inspired muse for writers – including students learning English, literature, poetry or journalism. Budding authors can practise capturing and conveying meaning and substance verbally. Students need only look up to observe that there are many colours besides blue in the sky and white in the clouds. Thoughts, ideas and descriptions can be audio, text or video recorded.

Despite the advantages, there are complications and prohibiting factors to learning outside. Some teachers say that it is difficult to maintain classroom control, discipline and management when learning outside. Both teachers and students can be distracted and let their attention lapse and weaken. Children


who associate the schoolyard with tea breaks may not be able to resist the urge to roughhouse when formal learning is moved outdoors. Students who are not partaking in the class may walk by and intentionally disrupt learning. Colleagues may not respect outdoor learning and shake the confidence of well-intentioned innovators.

The weather and other natural factors might also be prohibitive. Sometimes it is too hot to concentrate or too cold to be comfortable. The rain can soak potential seating and bird droppings can make settings unusable. Wind can blow away papers and distract students into worrying more about their hair than about learning. People can become dehydrated. Roots and stones can cause people to stumble or trip. Naturally poor acoustics and ambient sounds can make the teacher and/or students difficult to hear. Outdoor spaces are seldom dedicated as 'classrooms' or set-up to be conducive for learning. The chosen space may already be occupied and equipment and supplies may need to be hauled and stored. Areas may require clearing before they can be suitably used.

While it cannot solve all of these problems, education technology can be used as an enabling and enhancing factor in learning outside. In other words, outdoor learning is not possible without some technologies and is improved by others. The first factor to consider in technology-enabled outdoor learning spaces is the balance between bring-your-own-device (BYOD) and teacher and/or school provided devices. Many (but not all) students at school and university can bring their own mobile devices, including smartphones, tablets and laptops. Most also have a wide variety of productivity apps installed, enabling them to record, note-take, produce and readily save, store and share. However, it should not be assumed that every student will own and/or bring such a device. Experienced outdoor learning teachers are advised to have a class-set of software-loaded devices at hand so that no students are

disadvantaged by not being able to afford a device or by lapsed batteries.

The next enabling technology factor is Wi-Fi. Prior to moving outside, Wi-Fi should be tested. Most schools and universities have adequate and consistent Wi-Fi inside their classrooms and other interiors (such as libraries). Outdoor spaces are sometimes forgotten. Outdoor learning works well when teachers and students can use mobile devices to search phenomena and document, post and share observations, descriptions and images. Note-taking on mobile devices works well because it means that people do not have to cope with the conditions of wind and paper. However, most student note-taking apps work best with internet connectivity.

With technologies destined to continue to improve and develop, the needs, skills and expectations of modern learners are sure to keep pace. There is an undeniable allure of being mobile, free and unconfined in time, space and imagination. With the development and proliferation of education technology, previously bored students sitting at their desks and daydreaming out the window are increasingly being engaged through the novel and inspiring opportunities of learning in the fresh air of the outdoors. 

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